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ABSTRACT

New avenues and arrangements must be found for improving the occupational competency of teachers in order to meet the demand for skilled and recently-trained workers. Thus, this publication was designed to help teacher educators develop cooperative programs with industry so they may provide occupational experience programs for present and prospective teachers. The compact nature of the review and organization into guideline format should provide a ready reference for the practitioner seeking to develop and improve occupational experience programs for teachers in his college or university. Special attention was directed toward a review of existing programs, the development of guidelines for future program development, areas of concern, and alternative approaches. (Authors)

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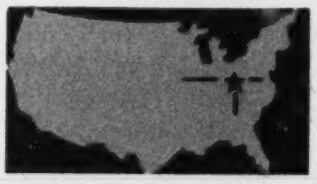
OCCUPATIONAL EXPERIENCE FOR VOCATIONAL EDUCATION TEACHERS

A Handbook for Teacher Educators



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ERIC Clearinghouse on Vocational and Technical Education

preface

This publication is designed to help teacher educators develop cooperative programs with industry so they may provide occupational experience programs for present and prospective teachers. The compact nature of the review and its organization into guideline format should provide a ready reference for the practitioner seeking to develop and improve occupational experience programs for teachers in his college or university. The authors have been selective by citing references believed to be especially useful to teacher educators.

The profession is indebted to James Smiley and Gary Beasley for their scholarship in the preparation of this report. Recognition is also due William Wolansky, Iowa State University, and Warren Meyer, University of Minnesota, for their critical review of the manuscript prior to its final revision and publication. J. David McCracken, information specialist at The Center, coordinated the publication's development.

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OCCUPATIONAL EXPERIENCE FOR VOCATIONAL EDUCATION TEACHERS

A Handbook for Teacher Educators

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September, 1971

contents

Scope Statement 1

The Problem 1

Programs in Operation 3

Suggested Guidelines 18

Areas of Concern 23

Alternative Approaches 24

Needed Research 25

Bibliography 26

introduction

In an attempt to make the information within the ERIC System more readily useful to vocational educators, The ERIC Clearinghouse on Vocational and Technical Education has planned a series of state-of-the-art papers on various topics of current professional interest. As part of this series, this document presents a review of the efforts being made to improve the occupational competency of vocational and technical teachers through the cooperative efforts of schools, businesses, and industries. A second purpose for writing this document was to suggest guidelines that teacher educators and supervisors could follow in developing preservice and in-service programs specifically designed to improve the occupational competency of vocational and technical teachers through such cooperative arrangements.

Sources used and cited in the preparation of this document were those found in *Research in Education* (RIE), *Abstracts of Research and Related Materials in Vocational and Technical Education* (ARM), and *Current Index to Journals in Education* (CIJE). These sources were searched from 1966 to the present. RIE and CIJE were searched by computer while ARM was searched manually. Review of research during the past five years was deemed sufficient to reflect the state-of-the-art in developing guidelines for cooperative arrangements to developing occupational competency.

The writers would like to thank Dr. J. David McCracken and Dr. Wesley Budke for their assistance in writing this document. Appreciation also is due Dr. Joel Magisos for providing the opportunity to the authors to prepare this document.

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scope statement

A problem of growing concern for vocational and technical education is that of improving the occupational competency of teachers. The rate of technological change makes previously acquired job skills obsolete within a short period of time and thus creates the demand for new ones. New avenues and arrangements must be found for improving the occupational competency of teachers in order to meet the demand for skilled and recently trained workers.

Vocational and technical education, through cooperation with industry, can operate viable new programs to solve this problem. This paper is an attempt to inform teacher educators and state supervisors of efforts that have been and are now being made in this direction. Included are reviews of selected programs developed to improve the occupational competency of vocational and technical teachers. Also included are guidelines useful in the development of additional programs, problem areas identified as related to the development of these programs, and potential areas for future research.

the problem

Many vocational education teachers are failing to provide students with the relevant knowledge and contemporary skills needed for successful employment because they are not keeping abreast to the degree necessary of occupational changes brought about by the advancing technology in business and industry. If teacher educators are to equip vocational teachers with pertinent occupational competencies, several problems must be resolved. For instance, how can teachers keep current their own knowledge and skills needed in business and industrial occupations? When and where can they obtain on-the-job occupational experiences? How can the teachers obtain all of these experiences in the shortest possible period of time? These topics are the primary areas of concern upon which the guidelines and future research will be based.

Need

Many educators and other public leaders have not discerned that the forces of technology are immediate in importance and national in scope, and that they carry serious consequences for the economic and social life of the entire country. Consequently, young people are entering a technological world of work unequipped with the tools they need for survival. Recent changes in automation have brought about new job descriptions and procedures in modern industry. Vocational education teachers need occupational experience to better teach the essentials for gainful employment.

The Manpower Report of the President (1970) notes the persistence of excessively high youth unemployment and school dropout rates and calls for better vocational-technical curriculums to conform to technological developments. This report also relates a 13 percent teenage unemployment rate among all unemployed, with 27 percent in city poverty areas. In addition, school dropouts in 1968 totaled 600,000 (Department of Labor, 1970). Underemployment, as well as unemployment, result from a lack of adequate training for the labor force.

Vocational education teachers need experience in business and industry because of changes in automation. High-speed computers, data-processing equipment, and electronic control devices have necessitated revamping the procedures and the job descriptions for numerous occupations. Therefore, vocational teachers should become competent in the job skills that are needed to teach to their students.

Through successful work related experience, a person becomes familiar with the skills, technological knowledge, and mores of the occupation he will be teaching. The report of The Advisory Council on Vocational Education (1968) relates enrollment growth of vocational education, expansion in the number of occupations and groups to be served, and an environment of social, economic, and technological unrest and change which points to an imperative need for teacher upgrading.

Smith (1969) refers to the responsibility of teacher preparation as a "perennial" or continuous process. He states that the teacher cannot receive all the training and knowledge required for a life-time career while enrolled in a preservice program. Teachers need to participate in in-service programs as well as preservice programs and should be encouraged individually to pursue personal development activities.

Cooperation of Education and Industry

The potentialities of an occupational experience program of teacher preparation suggest that higher education and industry could cooperatively bring about important breakthroughs in vocational and technical teaching. Ultimately, vocational education will be only as good as those who teach it (Venn, 1964). The preparation and continued updating of teachers must be the responsibility of the colleges and universities which provide teacher education experience in the relevant disciplines. Such teacher preparation programs will involve of necessity some new relationships between educational institutions and business and industry.

Burt (1967) points out that when industry and education ignore each other or fail to cooperate actively, the inevitable result is that schools turn out unqualified workers and industry suffers from shortages of skilled manpower. The students and society are cheated, while industry is forced either to engage in expensive in-plant training programs or be satisfied with untrained workers who give low-grade performance. The public thus pays twice—once for ineffective schools and again for the expense of ineffectively trained workmen in industry.

Federal legislation has provided funds for preservice and in-service

teacher education. The Vocational Education Amendments of 1968, Title II, Sec. 553(b), provide grants for projects and activities through the following:

> 1. exchange of vocational education teachers and other staff members with skilled technicians or supervisors in industry . . . and the development and operation of cooperative programs involving periods of teaching in schools providing vocational education . . .
>
> 2. in-service training programs for vocational education teachers and other staff members to improve the quality of instruction, supervision, and administration of vocational education programs; and
>
> 3. short-term or regular-session institutes, or other, preservice and in-service training programs or projects designed to improve the qualifications of persons entering and reentering the field of vocational education . . .

In addition, the Education Professions Development Act (EPDA) provides funds for upgrading teacher education under Part F of the Act (1967).

A variety of vocational teacher education programs are currently in operation throughout the country; in view of this, decisions must be made by teacher educators regarding appropriate preservice and in-service training programs. The following section contains a review of various programs in the service areas of vocational education. Particular attention has been given to programs which have developed sound cooperative arrangements with business and industry.

programs in operation

Several programs involving school-industry-business cooperation have been initiated to improve the vocational competency of teachers. This section of the paper includes a review of some of these programs in an effort to present an overview of what is happening in the area of teacher preparation and development. The programs described include an elaborate, multi-purpose program as well as a one-week in-service program. These descriptions will serve as a foundation in prescribing guidelines for the further development of preservice and in-service teacher education programs.

Training and Technology Project (TAT)

The Training and Technology Project's "Experimental Research Program for Vocational-Technical Teachers" (Merrill and Russell, 1968) was designed to explore the possibilities of vocational education and industry working closely together to develop and operate viable new programs for preparing and updating teachers of vocational and technical subjects.

Program Objectives

The project sought to achieve these objectives:

1. Establish ways to bring vocational shop, laboratory, and classroom instructors in selected industrial occupational areas as close as possible to current industrial practices and technology.
2. Develop vocational-technical teacher preparation programs in an industrially oriented atmosphere.
3. Stimulate and assist in establishing similar ongoing programs.

Operational Features

Project TAT is coordinated by Oak Ridge Associated Universities and the Nuclear Division of Union Carbide Corporation. Others involved in the project are the Tennessee Department of Employment Security, the Tennessee Department of Education, the Tennessee Division of Vocational-Technical Education, the University of Tennessee, and organized labor. Participants of the various programs are trained at the Atomic Energy Commission's Y-12 Plant which is operated by the Nuclear Division of Union Carbide.

Instructors are vocational educators at the University of Tennessee and personnel of Union Carbide Corporation in the Atomic Energy Commission's Oak Ridge Y-12 Plant. Oak Ridge Associated Universities, a corporation of 40 southern universities which carries out programs of education, training, and research primarily under government contract, administered and coordinated the project's activities during its early stages. These duties are now performed by the University of Tennessee and Union Carbide.

The TAT Project is concerned with both in-service and preservice education of vocational teachers. Degree credit for teacher training programs is provided through the University of Tennessee.

Activities of the participants enrolled in the in-service institutes include classroom instruction in industrial education methodology at the University of Tennessee training building in the Y-12 grounds. Each teacher selects two courses from a curriculum consisting of audiovisual media, curriculum building, shop organization and management, conference leadership, and teaching methods.

Participants observe demonstrations of the Y-12 equipment in their respective areas of interest and then follow up with actual training on the equipment.

Technical seminars are held and usually feature a lecture by the Y-12 personnel. Guidance and counseling services are provided and include testing aptitudes, reading comprehension, and technical competency of the participants.

Strengths and Limitations

Updating experienced vocational-technical teachers through an institute in an industrial setting surpasses traditional methods in both effectiveness and adaptability to individual needs. In addition to technical and profes-

sional education, the institute provides participants with a variety of personal associations with other teachers and staff members which contributes significantly to their professional development.

The industrial setting provides an integrated program for preparing and enriching prospective teachers in a rather short time. Its adaptability to individual needs makes it well suited to the preparation of ex-military personnel who have rich but highly varied technical and educational backgrounds. Also provided is an efficient way for persons currently in industry to gain a broader perspective on current technology within their own field and related areas before taking up teaching careers.

Implications

Education and industry, by working closely together, not only are able to develop highly effective teacher training programs, but in the process each institution can find new and more efficient ways to utilize its own resources. In addition, each institution can gain insight into the requirements and capabilities of the other.

According to the findings of the TAT Institutes, the complex problem of attracting and preparing significant numbers of persons for vocational-technical teaching careers must be approached from at least two directions. First is the need for stepped-up recruitment, including a continuing search for new sources of prospective teachers. Second, programs and methods of preparing persons for teaching must be responsive to the special requirements of those who pursue vocational and technical teaching careers.

Stout State University

In recognizing the need to improve the occupational competency of technical teachers, Stout State also recognized the benefits to be gained through school-industry cooperation. Through ties with business and industry, the teaching staff can become aware of new industry practices and technologies and of the skills required of beginning workers. With this firsthand knowledge, vocational and technical instructors can evaluate the relevancy of their curricula and teachings.

On the other hand, industry stands to gain benefits from close ties with education. Technical programs such as those at Stout State and other educational institutions represent the major source of competent workers needed by industry. By cooperating with educational institutions, industry can inform teacher educators, supervisors, and vocational and technical teachers of job opportunities and job requirements.

Entorf and Callender (1969) have described an exchange program which involved the cooperative efforts of the School of Applied Science and Technology at Stout State University and Deere and Company. A review of the first year's operation of this program is presented in the following paragraphs.

Program Objectives

1. To establish a closer working relationship between Stout State University and industry, in this case Deere and Company.

2. To update the occupational competency of the vocational teaching staff at Stout State.

3. To gain insight, through the exchange of personnel, pertaining to needed revisions of curricula and programs.

4. To assess the employment opportunities and requirements for workers in this field.

Operational Features

Having decided that the field of foundry would be of greatest benefit to both parties, the exchange of a foundry worker and a college foundry instructor was implemented. This program involved an instructor from Stout State University assuming a rotating supervisory role in six foundries of Deere and Company. Following a brief training period this teacher was placed in a foreman's position and given the opportunity to become familiar with the various operations in the foundries. This experience included learning current practices regarding metallurgy, quality control, and industrial relations.

To fill the teaching position left vacant by the participating instructor, Deere and Company selected a supervisor who could teach an introductory course and one advanced course in foundry. Although this supervisor had had prior teaching experience, he was given a brief orientation to Stout State. In addition to teaching the two classes, the representative from Deere and Company also participated in the routine activities required of a faculty member. While at Stout State he suggested improvements in the instructional program.

The instructor from Stout State and the supervisor from Deere and Company continued to draw their salaries from their home institution. However, Deere and Company paid the living expenses of both participants and the traveling expenses of its supervisor. Stout State assumed the traveling expenses of its instructor while he was at the foundries. Both participants submitted reports of their activities, thus providing data for evaluating the exchange program.

Strengths and Limitations

The strength of this program rests with the fact that there was an actual exchange of school and industry personnel. On the one hand, the college instructor gained valuable insight into the operations and technology of the Deere and Company, an experience which should contribute to assuring the relevancy of the educational programs at Stout State University. On the other hand, the visiting supervisor from Deere and Company gained firsthand knowledge of the problems and limitations of education in regard to vocational and technical training. Based on this mutual exchange of perspectives a closer cooperative effort toward a stronger educational program should result.

As noted by Entorf and Callender (1969), the weaknesses of this first attempt at an exchange program centered around the need for more

planning, orientation or training periods for the participants, and more coordination to assure a more meaningful experience.

Specific areas requiring attention in developing similar programs are as follows:

1. *Class Load*—The representative from industry should have three-fourths the normal teaching load, and the assignment should be in the area of the individual's specialty. The assignment should also be at an advanced level where he can make his greatest contribution. After a short orientation period, the representative should be assigned to a staff member in the pertinent departments for a specified time so that he may become familiar with the entire operation of the university.

2. *Counseling*—The representative cannot be assigned a class or classes and an office and then be forgotten. It is very necessary that he have a single individual upon whom he can rely for assistance. Preferably, he and his "counselor" should share the same office.

3. *Preparation*—There should be a one-week orientation prior to the exchange so that the representative from industry works with the instructor in an actual class situation. By the end of that period, the "new" teacher will be sufficiently familiar with the academic organization and with the physical facilities to make the transition easier. The authors also recommend that there be ongoing consultation between the two individuals involved while the program is in operation and that there be a debriefing period after the program ends.

4. *Breadth vs. Intensity of Study*—The itinerary for this program included too many plants. The time available at most plants was too short to get adequate coverage of areas. The two and one-half weeks as foreman were adequate, but it would be more desirable to spend more time at fewer plants.

5. *Specific Topics of Each Tour*—At the beginning of a tour, it would help to first see the end product and understand the requirements for its use. This arrangement would make for a better understanding of the actual processes and reasons for their use.

6. *Review of Program Scope*—The time allocated to actual foundry operation was adequate, but too little time was spent on the relation of materials engineering and product development programs. More time should be allocated to research laboratories, metallurgy and materials engineering, and the solution of production problems.

7. *Overlapping of Programs*—Each plant visited generated its own operations. These operations were not correlated among plants, with the result that there was some repetition. It would be desirable to arrange itineraries so that excessive repetition would be avoided.

Implications

This initial effort by Stout State University and the Deere and Company illustrates that an exchange program is feasible and worthy of

replication. While there were recognized weaknesses of the program, the overall effort was successful.

Wayne State University

The Department of Industrial Education at Wayne State University (Silvius, 1967) has tested several approaches which provide the technical and professional preparation needed for teaching vocational and technical subjects. Persons with extensive technical and industrial experience are encouraged to be vocational or technical teachers and to meet degree and teaching certification requirements.

Program Objectives

Through the cooperative work-study program, these experienced tradesmen or technicians are prepared to: 1) develop and organize teaching materials, 2) develop a course of study, 3) prepare instructional materials, 4) plan a laboratory, 5) counsel students, and 6) present the course content as it relates to their high level of specialization and experience.

Operational Features

The experienced craftsmen and technicians in the cooperative plan at WSU register for four to 10 quarter hours during successive terms. Their work experience is converted into college credit. Through the careful selection and planning of a series of college-level projects, it is possible to help these persons make an adequate transition from tradesmen or experienced technicians to industrial educators.

Credit at the University is based on advanced technical competence at the post-journeyman level. During the transition from an industrial setting to a teaching situation, these individuals work at advanced technical assignments, and emphasis is placed on professional orientation. The college coordinator counsels and directs the practicing tradesman or technician through a series of college-level projects designed to equip the potential teacher with the professional experiences necessary in organizing, developing, and structuring instructional material for a particular teaching specialty.

An orientation session for all persons enrolled is held on the first Saturday of a new term to enable those who are working full time to attend. A slide presentation by the departmental coordinator explains the objectives, procedures, projects, forms, and assignments that are needed for participation in the program.

The student arranges with his immediate supervisor in industry for the University coordinator to visit him on the job. During these visits, the coordinator has an opportunity to confer with the supervisor regarding the student's abilities, proficiencies, and responsibilities.

Strengths and Limitations

Through the cooperative work-study program, the student or industrial worker is able to translate his high-level and recently acquired technical skills into content that is in keeping with current educational goals for

occupational education in the schools or industries. The students, who come from a large variety of occupations, bring a diversified background of experiences to be shared with others enrolled in the organized and formal courses at the University.

The coordinator's sensitivity in observing the technical requirements and social adjustment exhibited by the student on the job definitely affects the success of the cooperative work-study program. Therefore, the plant visit becomes the vehicle for critical observation and evaluation, and a basis for projecting and planning projects to be completed at the University.

Implications

Universities need teacher education programs that are predicated on utilizing the resources of community industries in the preparation of teachers for vocational education. As potential vocational and technical teachers gather experience in writing periodic reports, doing library research, and organizing instructional materials, they become competent in organizing and structuring technical content into a logical and teachable format. The student in this program must be reaching journeyman status, or the equivalent, to participate in the program. The emphasis is placed on helping the experienced tradesman or technician relate his industrial experiences to the development of needed materials for a teaching situation and to extend technical insights. Through careful analysis, assessment, and direction, these craftsmen or technicians should make a systematic transition from industry to education.

San Jose State College

Bohn (1967) reported a pilot summer program at San Jose State College for teaching industrial subjects. The purpose of this project was to develop programs of in-service education which would upgrade teacher competency in understanding industrial materials, processes, and mechanisms; and identify the methods whereby this new knowledge could be used to update current practices.

Program Objectives

The objectives of the program were:

1. To develop model programs of industry-school cooperative programs with emphasis on industrial study trips, short work-experience programs, and interaction of short-term industrial schools with organized collegiate programs of teacher education.

2. To integrate organized instruction in the areas of industrial materials, cybernetics, and automation into four model programs of electricity, industrial drafting, metals technology, and automotive and power.

3. To evaluate the effectiveness and feasibility of industry-school cooperative programs.

Operational Features

The program concentrated on the four areas of electricity, industrial drafting, metals technology, and automotive and power. Four different methods of industry and education cooperation were used:

1. Half- or full-day study trips.
2. Industrial occupational experience.
3. On-campus industrial schools.
4. Off-campus industrial schools.

Each method of cooperation was integrated with on-campus instruction by department staff.

Student activities included lecture-demonstrations, experimentation under supervised labatory conditions, discussion sessions with industrial representatives, observation, and study trips to many local industries. Manufacturers of teaching aids and systems were invited to supply sufficient quantities of literature on their products for adequate evaluation. The use of these new teaching systems as well as the division and organization of subject matter were considered.

The electricity program included a study of the fundamentals of solid state devices including transistors and transducers, and their applications in electronic communications and industrial control. Emphasis was placed on the analysis of electronic circuitry, service procedures, instrumentations and methods of presentation.

The automotive program included instruction in current changes in automotive design and construction, hydraulics and pneumatics as they relate to automotives and industry as a whole, the utilization of different types of power in industry, and the conversion of energy through the use of industrial equipment. The industrial experience specifically assigned to this program was the integration of an industrial school with collegiate instruction. Participants attended the General Motors Training School at San Leandro, California. During and after this program, instruction provided for the integration of the specific knowledge presented at this school with the broad program of instruction for the automotive and power class.

The industrial drafting program consisted of a study of modern drafting procedures, new methods of industrial reproduction, advanced techniques of problem solving through drafting procedures, and the relationships of photography and electronic circuitry with drafting procedures. The industrial experience specifically assigned to this program was organized industrial work experience. Each participant spent a total of six days working and observing in industry. The experiences took place at six different companies and involved before and after classroom instruction.

The metals technology program provided instruction in the latest methods of joining, shaping, and forming metals, giving special consideration to new processes and uses of special alloys, metals and nonmetallic mixtures, and unique industrial uses of metals. This program made extensive use of the industrial materials and cybernetics and automation phases of the program. The industrial experience specifically assigned

to this program was organized study trips to industry. Numerous trips were taken to study specific operations and processes of industry.

Besides the assigned program of industrial experiences, each class used other types of industrial experiences which met specific needs. As a result, industrial lecturers and study trips were used by each program.

Industrial materials, automation, cybernetics, and curriculum planning were included with each program. The amount of instruction within these areas varied since instruction was planned to meet the specific needs of the teachers in each of the four instructional programs.

Strengths and Limitations

The program provides a great opportunity for vocational teachers to keep their knowledge and skills up-to-date with the ever changing industrial community. However, the cost of the program should be considered because of the national effort of the program.

Implications

This project reveals that industry and education can cooperatively provide teachers with industrial and business experience. Programs can be patterned after this project so that industrial requirements and practices can be integrated in instruction for students in the vocational subject areas.

Bowling Green State University

Program Objectives

To obtain occupational experience at Bowling Green State University (Goddard, 1970), prospective business education teachers with a comprehensive major are required to complete a work experience program entitled "Internship in Business Education." The students are expected to perform duties in filing, typing, shorthand, duplicating, and other general office work.

Operational Features

The course requires 40 clock hours of work for each quarter-hour of college credit and may be repeated to three hours. No more than one hour credit may be earned in any one office.

The work stations are selected by the student. The credit for the work experience must be earned under the supervision of the business education department. The instructor has the responsibility for approving work stations for credit, visiting the work stations to determine the quality of training, convening the class as a group at any time for the purpose of instruction, assigning projects in addition to those of the work stations, and assigning the final grade. This final grade is based on the preparation of an office manual describing the activities performed in the office where the student worked, periodic evaluations by the instructor and the student's immediate supervisor, and a final evaluation by the instructor.

Up to 80 clock hours of work experience may be waived if the student has completed at least 40 hours in two separate office positions. The

waivers must be bona fide office experiences verified and approved by the department.

Strengths and Limitations

The program provides the opportunity for prospective teachers to observe and get acquainted with modern office equipment. The work stations would probably be more effective if the teacher education staff were to choose work stations for this occupational experience rather than leaving the selection up to the students. However, the program shows strength in that the student is required to gain occupational experience under the supervision of the business education department.

Implications

Through a systematic and planned program involving business and industry in the preparation of teachers, these prospective teachers may obtain needed knowledge and skills for teaching while pursuing a degree.

Bucks County, Pennsylvania

Using both state and county funds, business education teachers in Bucks County and at Temple University developed the Directed Observation of Elementary Office Positions Program.

Program Objectives

Identified objectives of the Directed Observation of Elementary Office Positions Programs were:

1. To establish a closer working liaison with local businessmen.
2. To gain insight into the job requirements for entry level office positions.
3. To gain information useful in updating business education curriculums and programs.
4. To gain information useful in counseling students interested in office occupations.

Operational Features

This in-service program was designed to last one week and to provide business education teachers with an opportunity to observe work procedures and office machines operations.

Beginning with an orientation session on Monday, Beck (1967) reports that the program provided teachers with an opportunity to evaluate their business education programs with the added perspectives of businessmen and office workers. The teachers also obtained guidance information for students, established job placement contacts that should prove helpful in placing graduates, and examined various departments of their host company. On Friday, sessions were held to evaluate and summarize the week's activities. Another outstanding feature of this workshop was that the participants received a stipend for the week's activities.

Strengths and Limitations

While it may be questioned whether one week is long enough to update

the occupational competency of teachers, Beck stresses that the brevity of the workshop was one of its major selling points. It was felt that a shorter session would be more flexible in that a week could be easily accommodated into the schedules of both the teachers and businesses. Another strong feature of the program was that teams of teachers were assigned to a participating firm within their own district. This arrangement made possible a sharing of experiences and ideas by the teachers and the acquisition of information concerning local employment and business practices.

A major weakness of this workshop may be the heavy emphasis placed on the observation method. An integration of the hands-on approach may have added significantly to the program.

Implications

This program is an excellent example of what can be done to update the occupational competency of vocational teachers by means of a short workshop session. The Bucks County Program should be of particular interest to those administrators and teacher educators that have limited funds and resources available for this type activity. It also illustrates how teacher educators, local and state administrators, and teachers can cooperate to develop a meaningful in-service program.

Virginia Polytechnic Institute

Lucas (1969) describes the distributive teacher education program at Virginia Polytechnic Institute and State University for DE majors. The student enters the senior block in the spring quarter of his junior year, enrolling in courses that prepare him for the first phase of his required occupational experiences which takes place during the following summer months. In the fall he is back on the campus full time for another cluster of courses. The last quarter of the senior block involves Phase II of the occupational experience and his student teaching.

Program Objectives

The purpose of this directed occupational experience is to develop through personal experience occupational knowledge, understandings, skills, and attitudes of prospective distributive teacher-coordinators to the end that these teacher-coordinators can provide appropriate occupational experience competencies to distributive workers.

Operational Features

For the first phase of their occupational experience, students are employed during the summer months in distributive businesses throughout the state. At the beginning of the summer, the staff member directing the students visits each cooperative establishment to hold a conference with the immediate student supervisor, store personnel, and the student. At the conclusion of the summer quarter, the student completes a store operations manual on the five areas of sales promotion, merchandising, store operation, control, and personnel.

During the fall quarter he is enrolled in methods and other distribution courses including teaching experience in pre-employment adult education. The student begins the final quarter with a three-week field experience in the community where he will do his student teaching. He is assigned to three distributive businesses which represent the categories in which employment of high school DE students is most prevalent.

Strengths and Limitations

The community exposure brought about by Phase II of the work experience builds up confidence and competence on the part of the student teacher. He knows the community and can refer to local examples instead of referring to other locations and programs. This program provides for two phases of directed occupational experience.

Implications

The attempt in this approach is to make better use of the student teacher's time. The full year concentrated on DE courses along with the directed occupational experience is expected to make the teacher more competent. The opinion reflected in this plan is that directed occupational experience is another important ingredient in the total preparation of DE teachers.

Rutgers University

Program Objectives

In the Spring of 1968, the Department of Vocational-Technical Education at Rutgers (Meyer, 1969) developed a self-directed field experience and seminar program for master's degree candidates who will teach or coordinate courses in gainful home economics related occupations at secondary, post-secondary, and adult levels. The externship is offered at two levels: exploration in home economics related occupations, yielding three credits; and supervised field work experience in home economics related job clusters, also for three credits.

Operational Features

Learning experiences at the first level are designed to drill the extern in three competencies: 1) knowledge of content to be taught, 2) ability to seek counsel and to assess community resources and employment demands to justify the creation of a new occupational program, and 3) ability to plan curricula. Each extern selects one cluster for in-depth investigation, and then develops techniques and instruments for carrying out the investigation. These techniques and instruments include a study of interview techniques, establishing schedules for interviewing employers and employees, and the development of an observation form for recording entry-level and upward-mobility job opportunities. The observation instrument is constantly refined during the investigation process. The first step is to observe five job situations in the selected cluster and identify tasks in relation to basic knowledge, skills, attitudes, interpersonal relationships involved, and occupational climate as it affects the worker. Next, the student interviews five employers and five employees to discover employer

expectations, employee problems and needs, and the potential for upward mobility in each job.

The externship program requires that the student develop skills in contacting and establishing rapport with prospective employers, placement services, school personnel, labor and industry personnel, and parents. Each student selects the community most relevant to his needs and interests.

In the curriculum development phase, each extern plans a training program in a home economics related job cluster, and suggests facilities, equipment, and instructional resources.

The second level of the externship program is a supervised, cooperative, on-the-job work experience program which gives students an opportunity to identify skills in which they need greater proficiency and to sharpen those skills during the work experience. Students select three or more jobs in an occupational cluster for intensive study and actual work experience.

Employer report forms and employee self-evaluation techniques and instruments are emphasized. At this level, the candidate proposes a specific area or problem to be studied in depth and eventually incorporated into his master's thesis.

Implications

Although this externship experience is part of a master's degree program in vocational-technical education at Rutgers, it could be adapted to other levels or service areas. It would be suitable as an instructional packet for groups or individuals in a university summer session, or in a local in-service program with or without credit.

University of Illinois I

Program Objectives

To determine how, when, and where teachers of agricultural occupations keep current their knowledge and skills in non-farm agricultural occupations, the teacher education staff at the University of Illinois designed a four-week experimental cooperative education program (Mannebach, 1970) involving structured, on-the-job, occupational experiences in agribusiness plus related instruction in the classroom for teachers of agricultural occupations.

Operational Features

The teachers enrolled in the program spent Tuesday, Wednesday, Thursday, and Friday mornings participating in structured occupational experiences in agricultural firms. On these same days, the teachers received two hours of related classroom instruction at the University. On Saturdays and Mondays, the teachers obtained a variety of unstructured experiences of their own choice in agricultural firms in their local communities.

The informal experiences served to supplement the structured occupational experiences and provided experiences in other agricultural firms.

The structured occupational experiences were planned to provide teachers with on-the-job training in agricultural firms and to help them become informed realistically regarding the factors involved in the movement of products from agricultural firms to customers. The structured occupational experiences in the agricultural firms centered on completing selected activities and finding answers to prepared questions.

Instruction in the classroom during the four-week period was focused on analyzing the experiences of the teachers, intellectualizing these experiences in terms of educational objectives, and planning units of instruction for use in actual teaching situations. Primary emphasis in the classroom consisted of resolving how the teachers' experiences could be reflected most effectively in teaching plans and in teaching.

Strengths and Limitations

Evidence collected from the cooperating agricultural businessmen and from the high school and junior college teachers enrolled provided insight into the strengths and weaknesses of the four-week program. The evidence indicated that the teachers and the businessmen liked the concept of using structured occupational experiences. The teachers felt that such experiences, especially if discussed in the classroom, were very beneficial in planning and organizing instruction for teaching. The teachers also like the general method and approach used for obtaining important technical and occupational experiences. They especially liked the structured questions which were designed to guide them in asking about the organization, management, and operation of the agricultural firms, and they were pleased with the worksheets used to gather operational information about firms.

Most of the agricultural businessmen felt that the teachers should have spent more time with the firms. However, the teachers preferred the half-day spent in the agricultural firm and the two-hour period spent in the classroom. In future years the junior college teachers wanted to obtain their experiences in the same type of firm, while high school teachers were more willing to gain a wider range of experiences in different types of agricultural firms.

Similar Program

Colvin (1971) describes a three-week summer internship program for 17 Louisiana vocational agriculture teachers. The teachers were enrolled in the Louisiana State University Graduate School for three hours credit while they received experiences in farm machinery equipment and wood industries.

University of Illinois II

Program Objectives

Williams and Coil (1970) describe a one-week intensified workshop that was conducted by the International Harvester Company at their Hickory Hill Service Training Center. The program was designed for teachers of agricultural mechanics and involved cooperative planning by

agricultural occupations consultants from the Board of Vocational Education and Rehabilitation, teacher educators from the Agricultural Education Division at the University of Illinois, International Harvester personnel, and junior college instructors.

Operational Features

Workshop participants were taught by experienced instructors at the Hickory Hill Service Training Center and received instruction concerning the service and repair of new parts currently used on agricultural equipment. The concept of learning-by-doing was implemented through small laboratory classes of approximately five students per instructor and utilized student training teams. Teaching aids such as cut-away parts and complete parts and equipment were used extensively. Part of the instruction time was set aside for discussing and demonstrating teaching techniques that the participants might find useful in their non-teaching situations.

Strengths and Limitations

The program provides the opportunity for teachers to receive instruction and training from experienced, knowledgeable instructors who have had well-rounded service experience and specialized training in their teaching area. To insure that participants receive personal attention, laboratory classes never consist of more than five or six students per instructor.

Probably the weakest part of the program is its brevity. More knowledge and skills can be provided through more and extended occupational experiences for vocational teachers.

Implications

Agricultural industries have excellent facilities and competent instructors who train their own employees. Through joint planning by education and industry, specialized training programs which will meet the needs of in-service teachers can be scheduled. These cooperative efforts by educators and industry personnel to update the occupational competency of agricultural teachers hopefully will result in students being better trained in this area of vocational education.

Similar Program

Stinson and Cross (1969) relate a similar one-week work-experience workshop in ornamental horticulture sponsored by the Pennsylvania State University.

Colorado State University

Glenn and Orr (1969) describe a vocational internship program at Colorado State University in which the student can earn both his vocational credentials and bachelor of education degree within a five-year period.

Program Objectives

The program was organized to relieve the shortage of qualified vocational education teachers. In addition, the student can be self-supporting

while developing occupational competency that can be applied in future teaching.

Operational Features

Enrollment in the vocational internship program is open to high school graduates, junior college transfers, and adults. The internship consists of a formal agreement between CSU and the student who is interested in becoming a vocational education teacher. The agreement details the individual's program of formal instruction and the correlated occupational experience.

Strengths and Limitations

One of the many advantages of the program is that it gives direction to the student—he knows where he is going and he knows what his goals are. Equally important, he is provided with a detailed plan for accomplishing his goals.

Because of his orientation to teaching while still learning, he will be more cognizant of methodology, related training, technical information, and good teaching practices. The occupational skills he learns will have added significance because he knows he will one day be teaching them. Another advantage is the wage-earning capacity, which not only affords the intern the opportunity to be self-supporting while learning, but helps him develop a spirit of independence and accomplishment which can carry over into his future teaching.

Transferring from a junior college to a four-year institution is a problem that many vocational students have faced. Under the CSU internship program, the loss of credits should be minimal. With each intern having a highly personalized program tailored to his needs, the advancement and articulation should be smooth and effective. It takes time to fully develop potential instructors under the internship approach, but it is a positive, workable program.

Implications

Through adequate planning and supervision in developing the formal agreement between the student and the university, such a program shows promise in relieving the shortage of qualified teachers. Probably the greatest positive factor in the program is the time element. A student can receive the occupational experience and professional training in a five-year-or-less time span. Also, the employment makes it possible for more students to enter the field of education.

suggested guidelines

Early in the planning stage, the program developers must decide what type of cooperative teacher training program is to be offered. While some may want to develop a program to meet both preservice and in-service

needs, as was the case with Project TAT, others may want a program limited to either in-service or preservice personnel. Both preservice and in-service programs are needed, but limited resources may rule out the more comprehensive program. Once the decision regarding the type of program to be offered has been made, more definitive consideration can then be given to the matter of the program format. If the planned experience is to be for preservice personnel, it may be desirable to incorporate this experience into the existing teacher education program. On the other hand, if the cooperative training program is being planned for those already in the field, the experience may be designed as a summer institute or a workshop planned during the academic year. When both preservice and in-service personnel are to be served, a combination of the above approaches may be used.

A. Program Objectives

To realize the greatest benefit from a cooperative education effort, clearly defined objectives must be formulated. Once established, these objectives can provide direction in further developing the programs and can serve as a measuring rod in their evaluation. In other words, it is important to know from the outset what is to be accomplished and to have some means of determining whether the program is progressing along the planned course. Also, it is necessary to evaluate educational programs in terms of effectiveness. Stated objectives provide a sense of purpose and direction in the evaluation of the program.

As programs to improve the occupational competency of vocational and technical teachers are developed, specific objectives should be formulated within a common framework of general objectives. These specific objectives should reflect the special needs of the respective participants. A suggested framework of general objectives includes the following points:

1. To improve the occupational competency of vocational teachers in preparing students for the world of work.
2. To learn about new technologies and practices used by business and industry so as to further curriculum and program development.
3. To promote school-business-industry cooperation in the education of vocational and technical teachers to maintain industrial relevancy.

B. Program Strategy

After objectives have been established, a strategy should be formulated to develop, implement, and operate programs to improve the competency of vocational teachers. Such a strategy should incorporate the following points:

1. Adequate time must be allowed to plan the cooperative teacher training program and to consider such needs as staff, curriculum, and the people to be served. Whenever possible, the staff and participants should be involved in these planning activities. Also, an advisory

committee should prove to be a valuable resource in program planning.

2. An orientation program should be planned. Participants need to understand their roles in the program, what is expected of them, and what they can gain from active participation.

3. Industry and business personnel who are going to serve as instructors, consultants, and supervisors need to go through an orientation period in order to become familiar with educational practices and to learn some teaching methodology.

4. While in the work training phase of the program, participants should be visited by the coordinator. Such visits should help the trainee adjust to the work situation.

5. Efforts should be made to insure feedback necessary in detecting problems and in evaluating the program. Such feedback may be provided through seminars, surveys, class discussions, employer evaluations, and through visitations.

C. Program Staffing

Evans (1970) states that the success or failure of any educational program is related directly to the quality of the staff. Thus, every effort must be made to recruit staff members who are effective in planning and operating new programs. Consideration should be given to the following points:

1. Vocational teacher educators presently on the staff should be considered as a source of teachers and administrators for the cooperative teacher education training program. Such personnel may teach classes in methods and curriculum development (Project TAT) or serve as program coordinators.

2. Business and industrial personnel should be utilized when possible. This may mean using business and industrial personnel as consultants, as supervisors of on-the-job training, as teachers in an exchange program, or as resource people.

3. Retired military personnel with expertise in related areas should be considered as consultants, instructors, or resource people.

4. A coordinator of the program, whether in-service or preservice, should be designated and he should be provided with an adequate supporting staff. This coordinator should be chosen early so that he can participate in planning the program and in establishing objectives.

Careful consideration should be given to the role of the program coordinator. This person has an important part to play in making the program a success. The coordinator should be concerned with planning the program, selecting participants, selecting work stations, visiting the participants at their work stations, and evaluating the participants and the program.

D. Curriculum Development

Another integral part of any program is the curriculum. The curriculum for the cooperative teacher training program must be designed and developed to realize the objectives of the program. Ideas or concepts for developing the needed curriculum may be obtained through a review of existing programs such as those in the preceding section of this paper. Also, there are limitations to be recognized in developing a curriculum. Some of these limitations are as follows:

1. The development of a curriculum and instructional materials must be based on the concepts to be taught.
2. The curriculum must by necessity reflect the availability of staff, consultants, resource people, and other personnel.
3. The curriculum must reflect the needs of the participants.
4. Curriculum development will be influenced by the availability of educational facilities and equipment.
5. Curriculum development will be dependent on the availability and use of business and industry facilities.

E. Selection of Work Stations

When trainees are to receive instruction and training in a work situation, steps must be taken to insure a meaningful experience. Each participant must receive training in his own area of specialization in order to improve his occupational competency. Therefore, the following procedures should be considered in selecting work stations:

1. Make a survey of businesses and industries in the area to determine availability of resources.
2. Determine those businesses and industries that are willing to cooperate in the education of teachers.
3. Visit those places that are interested and explore possible methods and procedures for utilizing industrial personnel, facilities, and equipment.
4. Explain the importance of close supervision for in-plant training as well as the use of a training plan and agreement.
5. Select work stations based on the needs of the participants.
6. Compensate participants for work completed for the employer.

F. Selection of Participants

Criteria for selecting experienced teachers and/or prospective teachers to participate in these training programs must be established for each program.

Established criteria for these programs may include the following:

1. Participants should be selected on the basis of personal and professional benefit to be gained from the program.
2. An individual's previous training and educational specialty should be considered with regard to availability of related activities.
3. A procedure for screening and selecting participants should be

established. This may include soliciting applications, interviewing, and reviewing the person's previous education and work experiences.

4. Applicants should be chosen on the basis of potential contributions to the profession.

G. Program Costs and Financing

The level of funding required for a program will depend on several factors, such as the length of program and the number of participants to be involved. Other factors to be considered are:

1. Funds should be available to insure that the program is planned in such a way as to guarantee success.
2. Unless teachers are under a 12-month contract, funds should be available to reimburse participants for lost income while enrolled in the program. This should include travel expenses.
3. Funds should be available to hire and to reimburse travel expenses of the program coordinator and other needed staff personnel. This should include hiring consultants and other visiting staff.
4. Funds may be needed to develop instructional materials and to purchase supplies.

Some programs may not need additional funding. For example, a one-week seminar may be so planned and coordinated as to make use of available facilities, staff, and cooperating businesses. However, for those extended programs where funding is necessary, program planners may want to consider the following alternatives:

1. Request the needed funds through the college budget.
2. Apply for federal funding.
3. Apply for funds from the state department of education.
4. Apply for a foundation grant.
5. Apply for funds from the state research coordinating unit.

H. Advisory Committee

An advisory committee can be of great value in planning and implementing a cooperative teacher training program. An advisory committee can:

1. Help determine the need for the program by evaluating the competency of beginning workers in relation to job requirements.
2. Help gain the cooperation of businesses and industries, for example by providing work experiences for vocational teachers and by making their own personnel and facilities available for instructional purposes.
3. Help establish objectives of the program based on manpower needs.
4. Help evaluate the program from the viewpoint of a participating employer.
5. Serve as a resource for personnel, consultants, and instructors.

I. Role of the Coordinator

The role of the program coordinator has been noted already in relation

to establishing objectives and in relating to planning the program. The following is a summary of the coordinator's activities. He should:

1. Help establish objectives of the program.
2. Survey the business community to determine resources available for preservice and/or in-service education purposes.
3. Establish and meet with the advisory committee.
4. Select work stations.
5. Coordinate activities of business and industrial personnel, teachers, educators, and participants.
6. Select participants.
7. Place participants.
8. Visit participants at their work stations to help solve any problems they might have.
9. Evaluate participants through visitations and conferences with employers.
10. Help evaluate the program by gathering data from participants, employees, and resource personnel.

areas of concern

When analyzing the problems which might arise in preparing occupationally competent teachers, the following points should be considered:

1. The type of work experience must provide the most beneficial learning experience for individual teacher situations.
2. The occupational experience program should provide time for adequate experience in the functions of industry and in occupational requirements.
3. Vocational teacher education programs should include occupational experience as a requirement for graduation.
4. Occupational experience should be required for certification and to maintain certification.
5. In areas where there is a lack of industry, provision must be made to give vocational teachers the necessary training in programs such as summer workshops.
6. Occupational experience programs must be organized to insure participation of all vocational education teachers.
7. Programs should be provided to allow for participation of teachers without a strain on the local school.
8. The occupational experience program must be integrated with the existing teacher education program to insure adequate teacher preparation.

Program planners must recognize that there are some real problems to overcome in implementing programs to provide occupational experiences for vocational teachers. Rankin (Bell, 1967), lists five obstacles to teacher improvement:

1. Complacency—People tend to take comfort in adhering to an established routine, which makes it difficult to promote staff development programs.

2. No incentive—People in a given situation may not feel the need to participate in self-improvement programs.

3. Heavy work load—Teachers are busy. A heavy work load may preclude someone from taking part in a self-improvement program.

4. Limited resources—The lack of funds for scholarships and grants make it more difficult to recruit participants.

5. Limited and inflexible programs of graduate schools—Would-be participants may be more interested in satisfying the requirements for a degree than in improving their occupational competency.

When teachers have an opportunity to work in business and industry, some may decide to leave teaching. The salaries and opportunities in industry may appear more attractive than those found in teaching.

When summer experiences are used to gain occupational competence, the questions of financial support arise. The undergraduate student may be counseled and encouraged to seek his own occupational experience, and many may be unable to find adequate jobs. Adequate supervision and guidance must be provided to insure the best occupational experience for teachers.

When the occupational experience programs utilize industrial facilities, instructional use often conflicts with production use. The work experience programs should be arranged to provide for the least amount of conflict. Also, the participants in the training program must get experience with the most advanced equipment in industry and business to insure adequate teacher preparation.

alternative approaches

The cooperative teacher training program is not the only approach to updating the occupational competencies of teachers. In some instances it may not even be the best approach. Occupational competency can be improved through a meaningful work experience obtained solely by the individual teacher. This work experience is more likely to be acquired during the summer. Teachers can be granted a leave of absence to work in an industrial setting, in which case the terms of the leave can specify the types of acceptable work experience. Teachers can enroll in in-service workshops, institutes, and summer programs designed to update occupational competency—these programs may include field trips and lectures by business and industrial personnel. Teachers also can update their competencies through professional reading, and by attending professional conferences.

needed research

The review of cooperative teacher training programs already in operation revealed a variety of patterns. In an effort to improve the occupational competency of vocational and technical teachers, some programs incorporate a structured work experience while others rely on observation of business and industry personnel. Also, as in the Stout State program, industrial personnel have been used to teach classes and to recommend curriculum revisions.

The different patterns that have evolved in the development of these programs indicate a need to evaluate each approach to staff development to see which is most easily adapted to certain given conditions. Such research would indicate the desired structure of the work experience as well as the length and placement of the experience. Likewise, research on the effectiveness of these programs through follow-up studies should indicate the most effective use of business and industrial personnel, the observation method, and field trips.

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MISSION OF THE CENTER

The Center for Vocational and Technical Education, an independent unit on The Ohio State University campus, operates under a grant from the National Center for Educational Research and Development, U.S. Office of Education. It serves a catalytic role in establishing consortia to focus on relevant problems in vocational and technical education. The Center is comprehensive in its commitment and responsibility, multidisciplinary in its approach and interinstitutional in its program.

The Center's mission is to strengthen the capacity of state educational systems to provide effective occupational education programs consistent with the individual needs and manpower requirements by:

- Conducting research and development to fill voids in existing knowledge and to develop methods for applying knowledge.
- Programmatic focus on state leadership development, vocational teacher education, curriculum, vocational choice and adjustment.
- Stimulating and strengthening the capacity of other agencies and institutions to create durable solutions to significant problems.
- Providing a national information storage, retrieval and dissemination system for vocational and technical education through the affiliated ERIC Clearinghouse.